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Centro Nacional de Supercomputación



EXCELENCIA
SEVERO
OCHOA

EARTH SYSTEM SERVICES

ICTA-BSC synergies

Albert Soret Miravet and Nicola Cortesi
Services – Earth Science Department



OUR OBJECTIVE:

Facilitate technology transfer of state-of-the-art research from local, national to international levels in five areas:

Air quality assessments

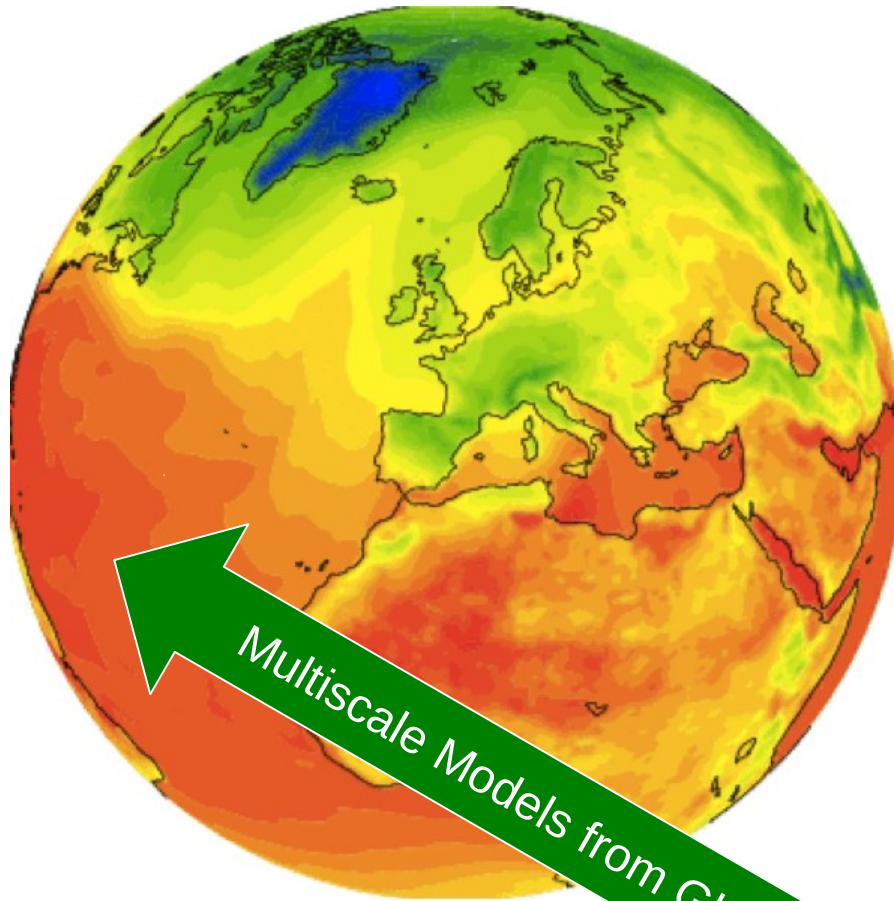
Mineral Dust modelling

Weather forecasting

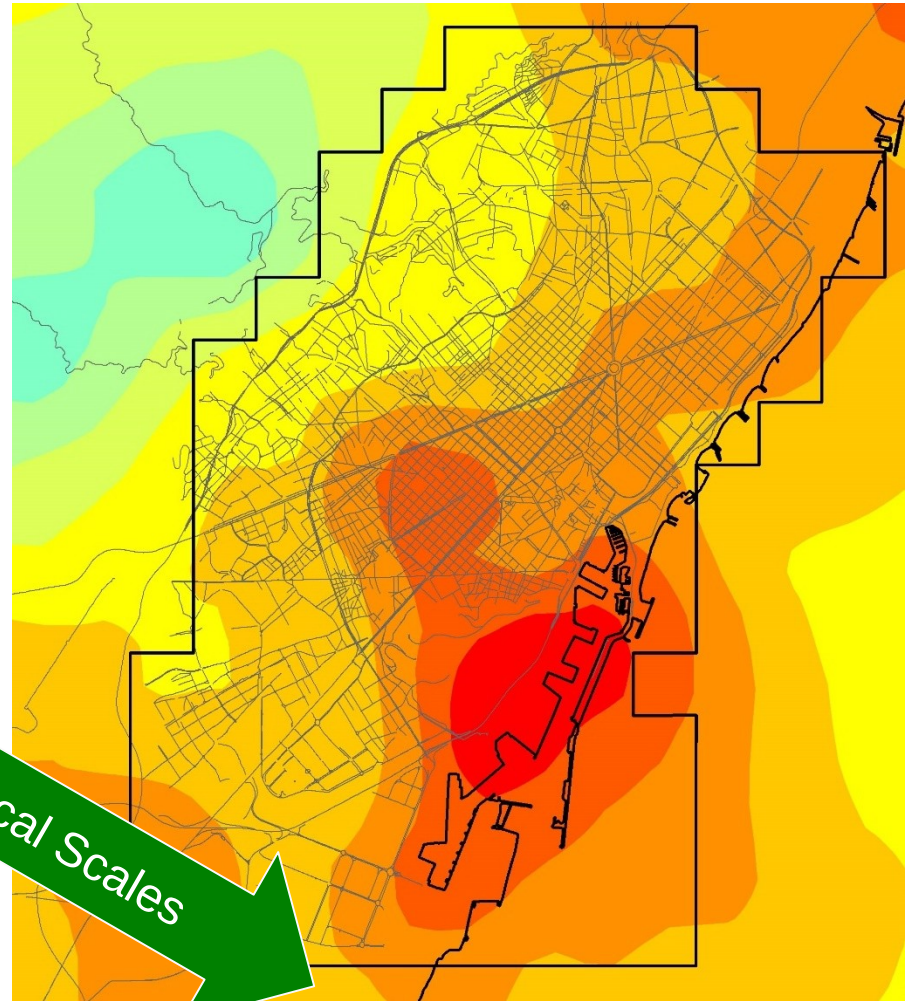
Climate predictions

Computational Earth Services

Multi-scale models from global to local scales



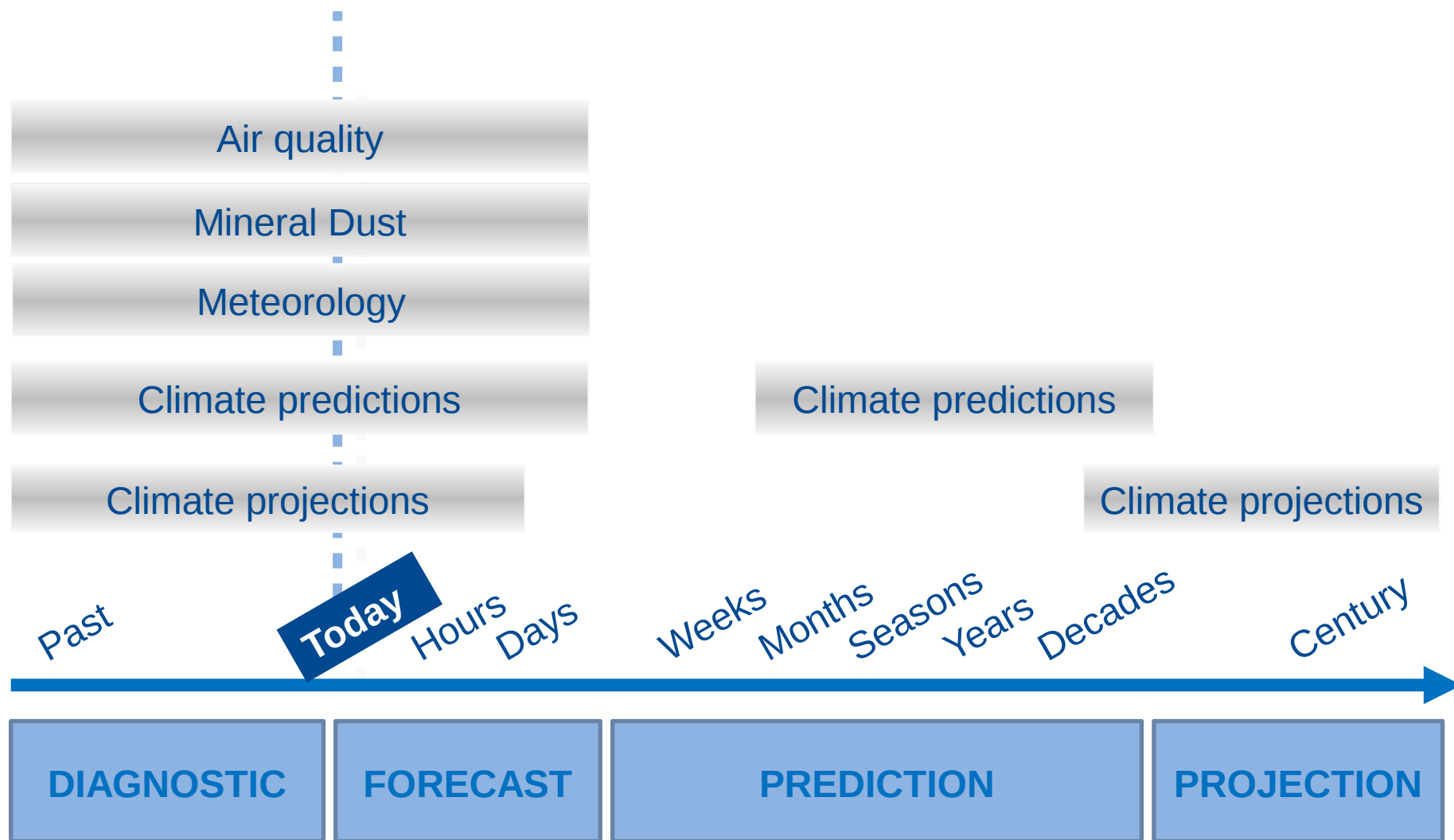
Multiscale Models from Global to Local Scales



Temporal scales

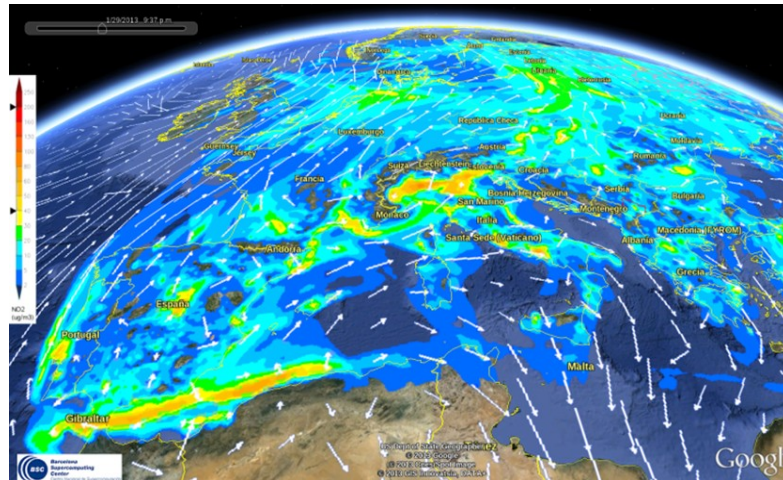


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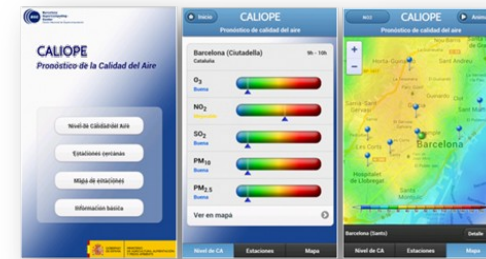


Air quality forecast system: CALIOPE

Provides air quality related information for the coming days and for the application of short term action plans for air quality managers.

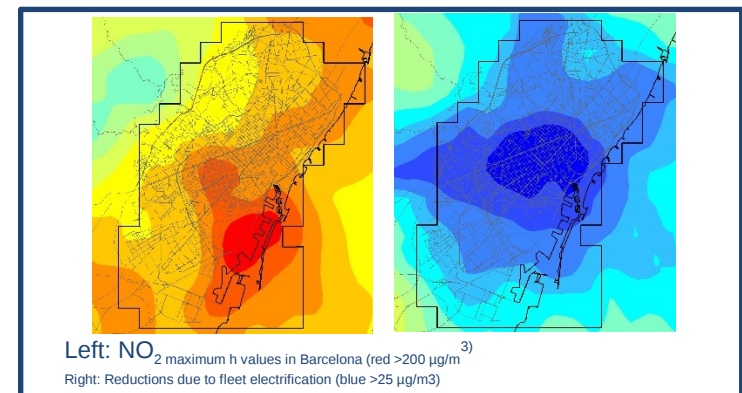
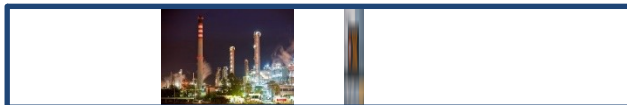


Information is delivered using both online or custom applications:



Air quality impact assessment

Air quality modelling provides comprehensive description of air quality problems by relating emission sources and atmospheric conditions

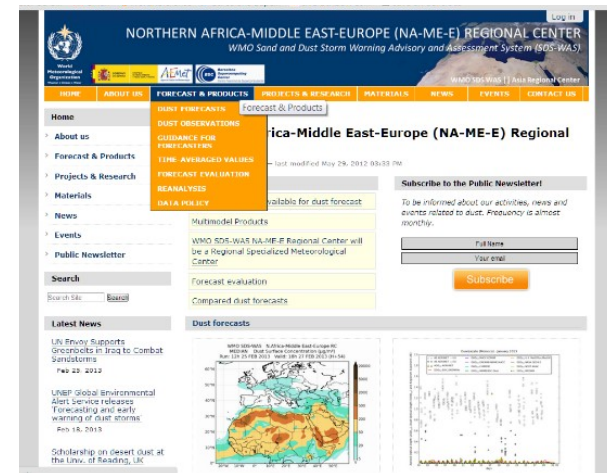


These projects have received funding from:



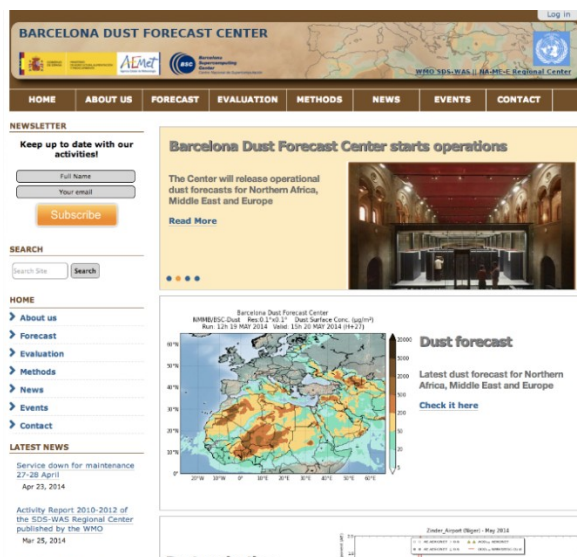
Mineral dust forecasts SDS-WAS North Africa, Middle East and Europe Regional Center

Early warning system
started in 2010

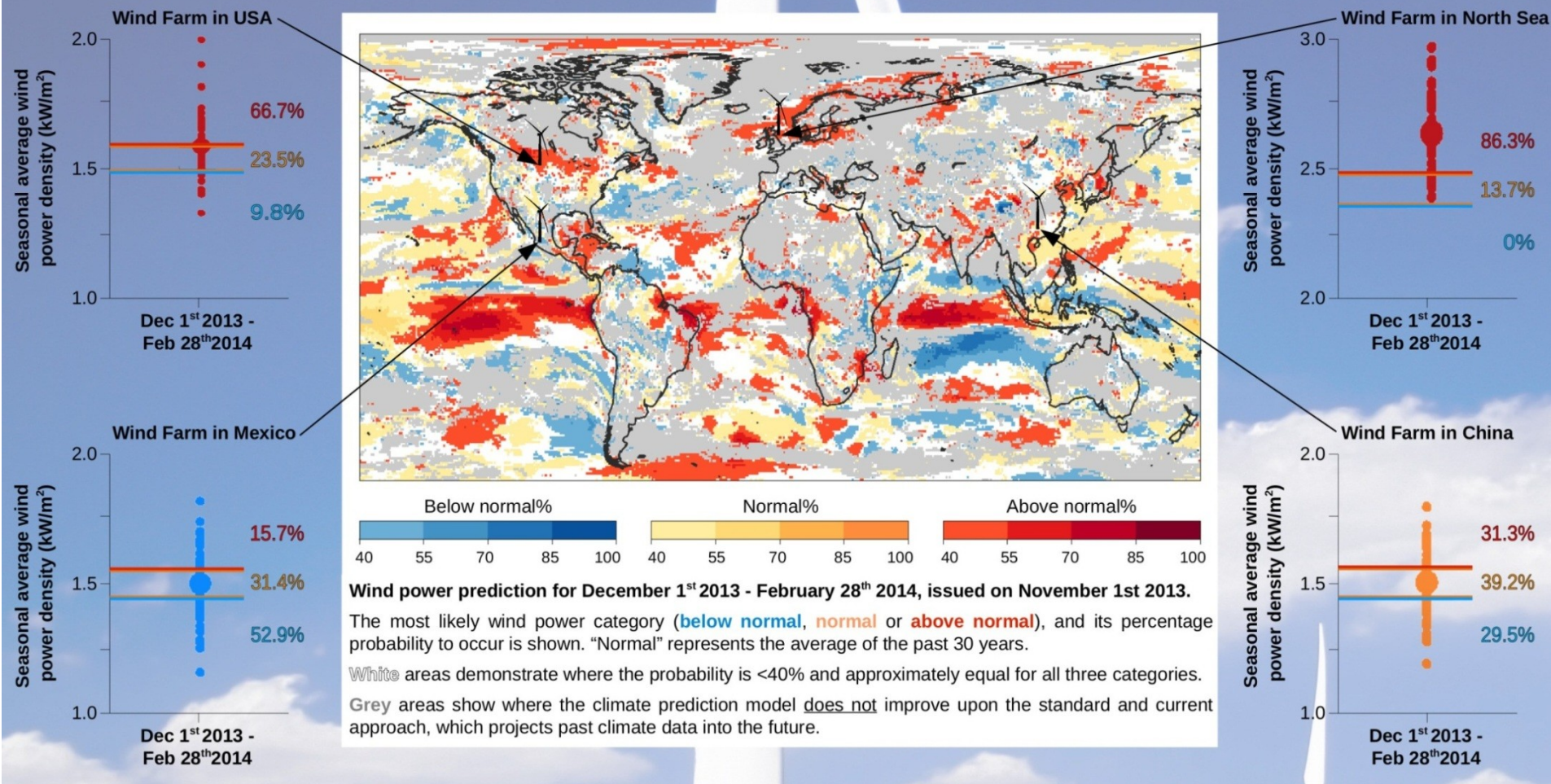


Barcelona Dust Forecast Center

First specialized WMO Center for
mineral dust prediction
started in 2014



Illustrative examples of seasonal wind power predictions



These projects have received funding from:



EUPORIAS



We are in contact with:



EnBW



ALSTOM



- Pollen forecast (Dr. Jordina Belmonte). FMI example.

- Which models do you use.

CFD, dispersión models?

Are microscale models nested with mesoscale models?

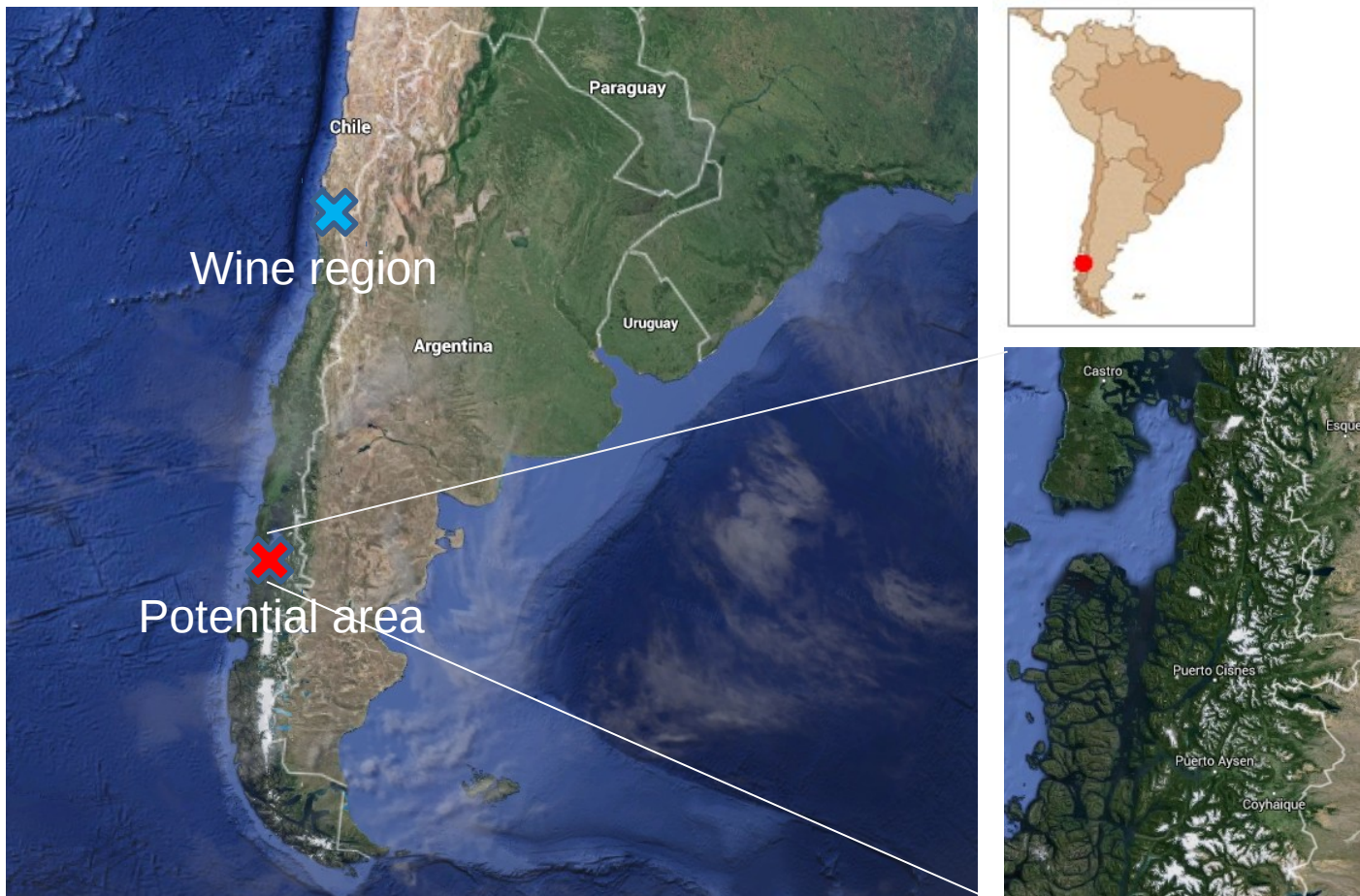
Air pollution has any relation with aerobiological pollution?



An example of a project: Planting new vineyards for Bodegas Torres

A case-study: climate projections for wine-makers

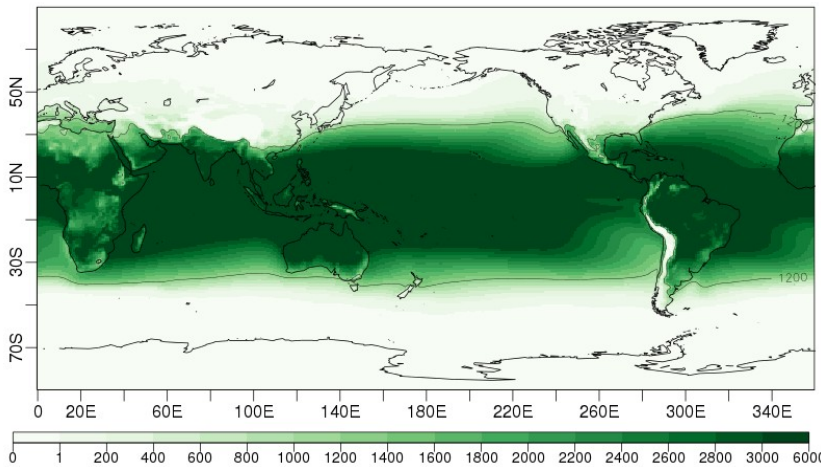
Objective: identify if and where grape can grow in Patagonia in 2050



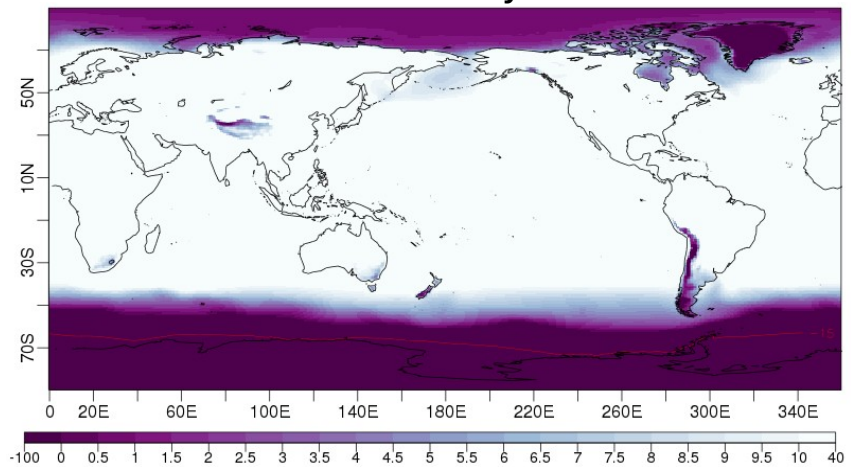
A case-study: climate projections for wine-makers

Wine Indices for present climate (ERA-Interim)

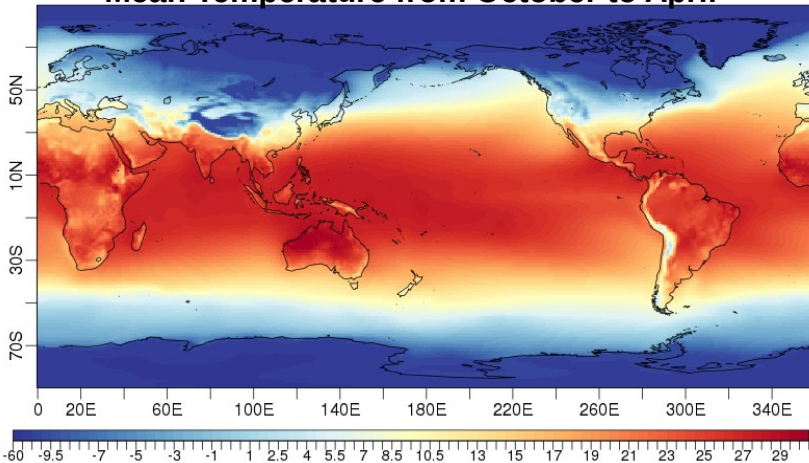
Winkler Index



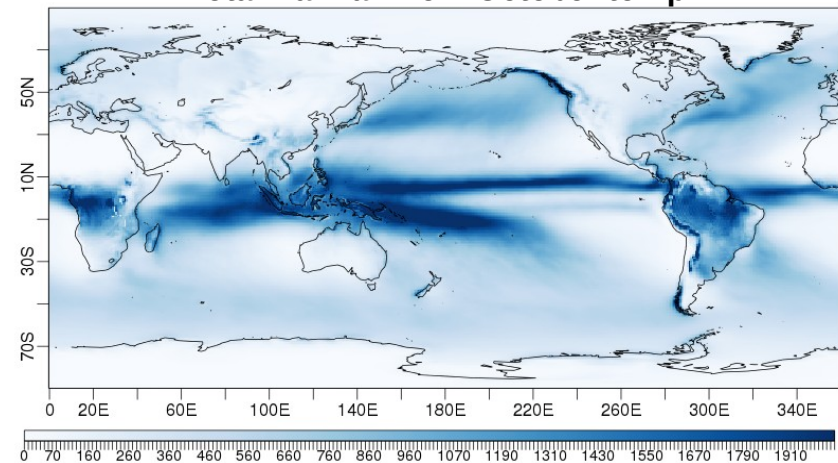
Winter severity Index



Mean Temperature from October to April

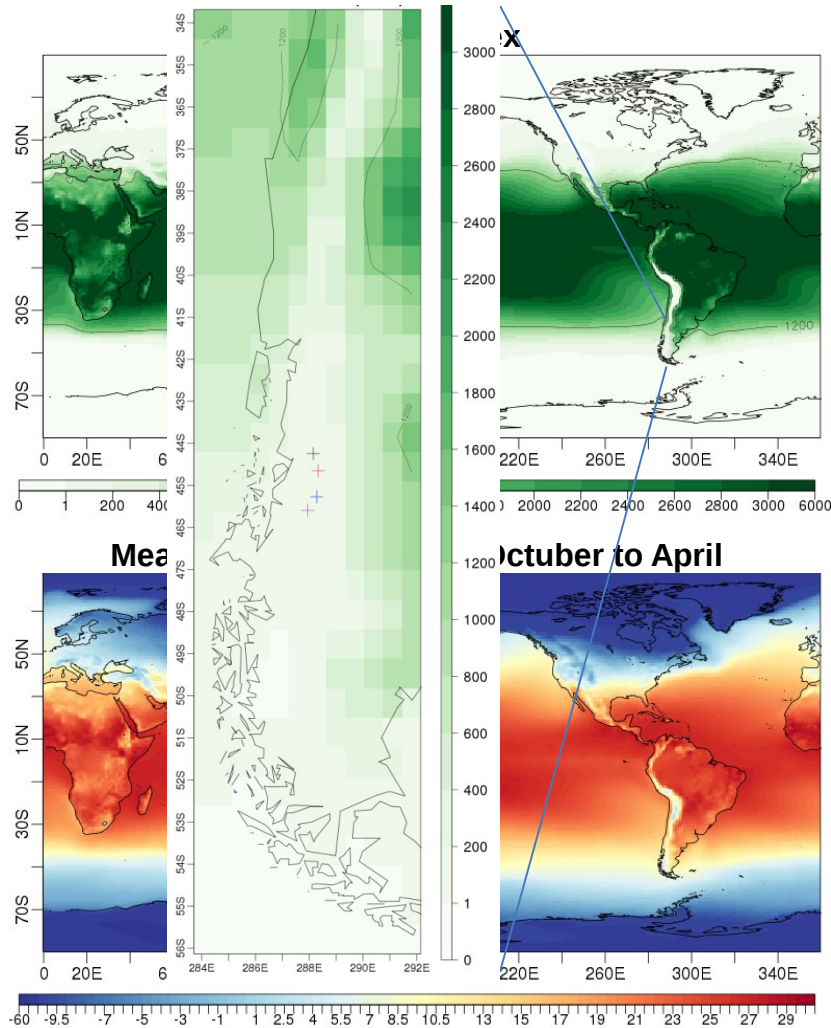


Total Rainfall from October to April

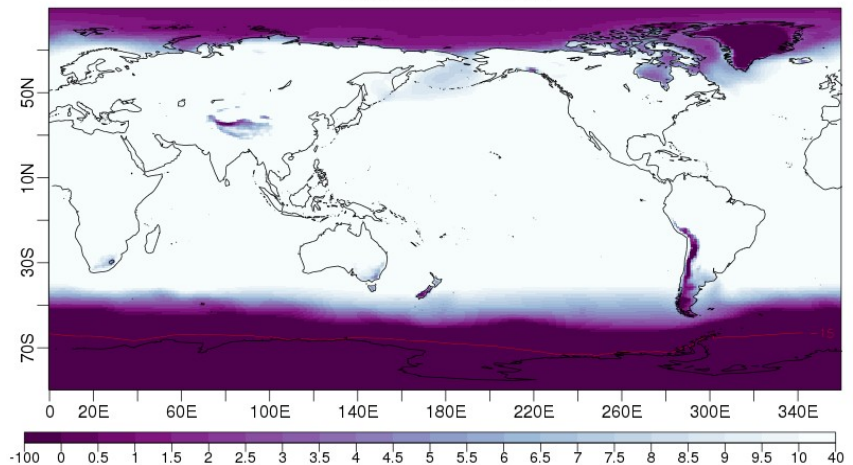


A case-study: climate projections for wine-makers

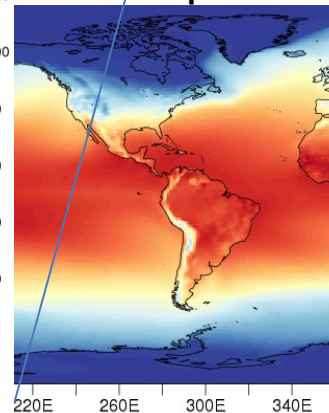
Present climate



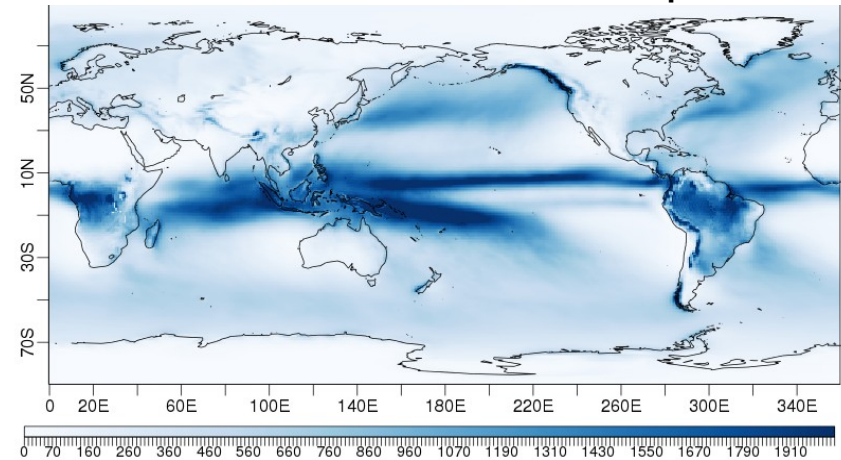
Winter severity Index



October to April

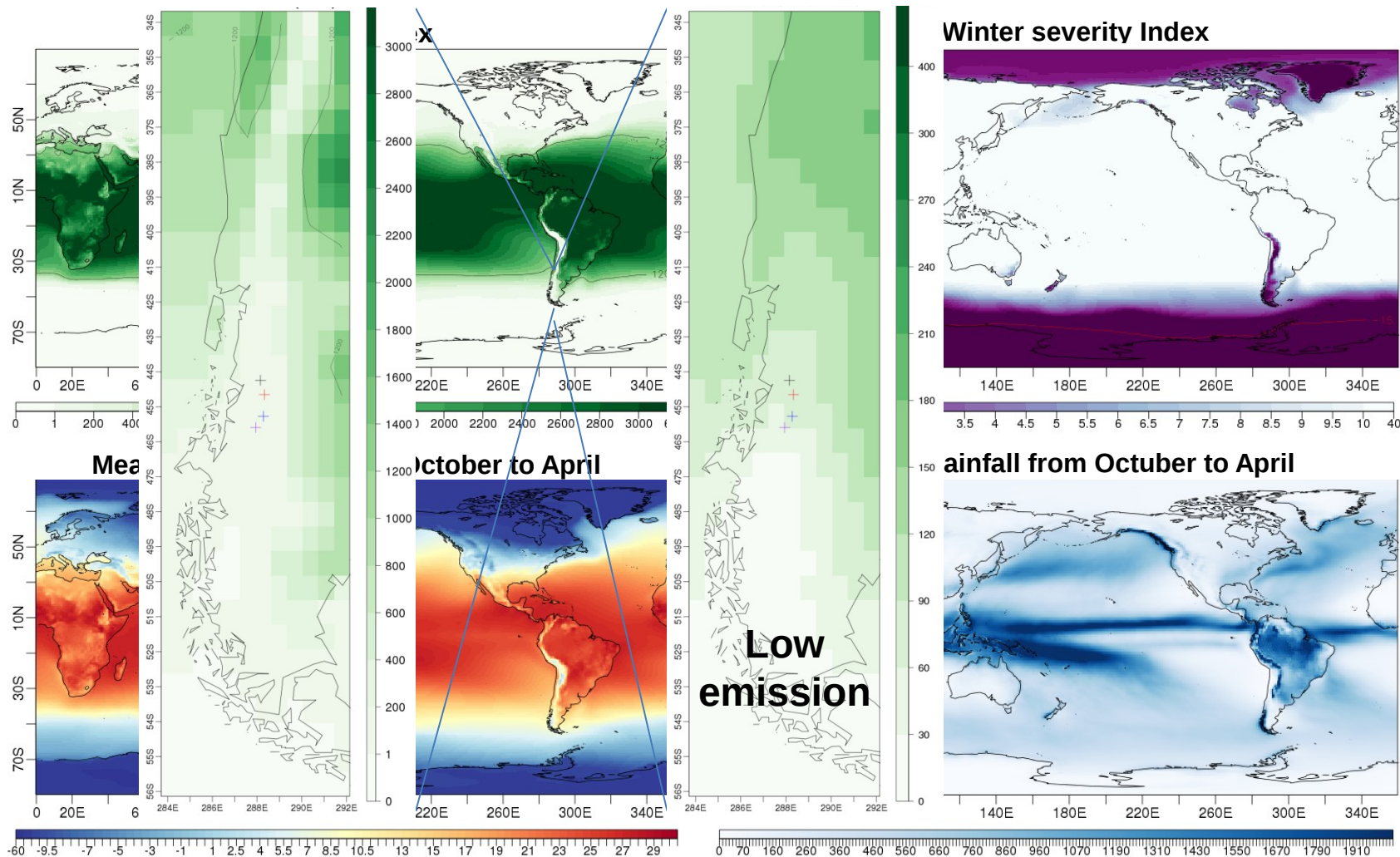


Total Rainfall from October to April



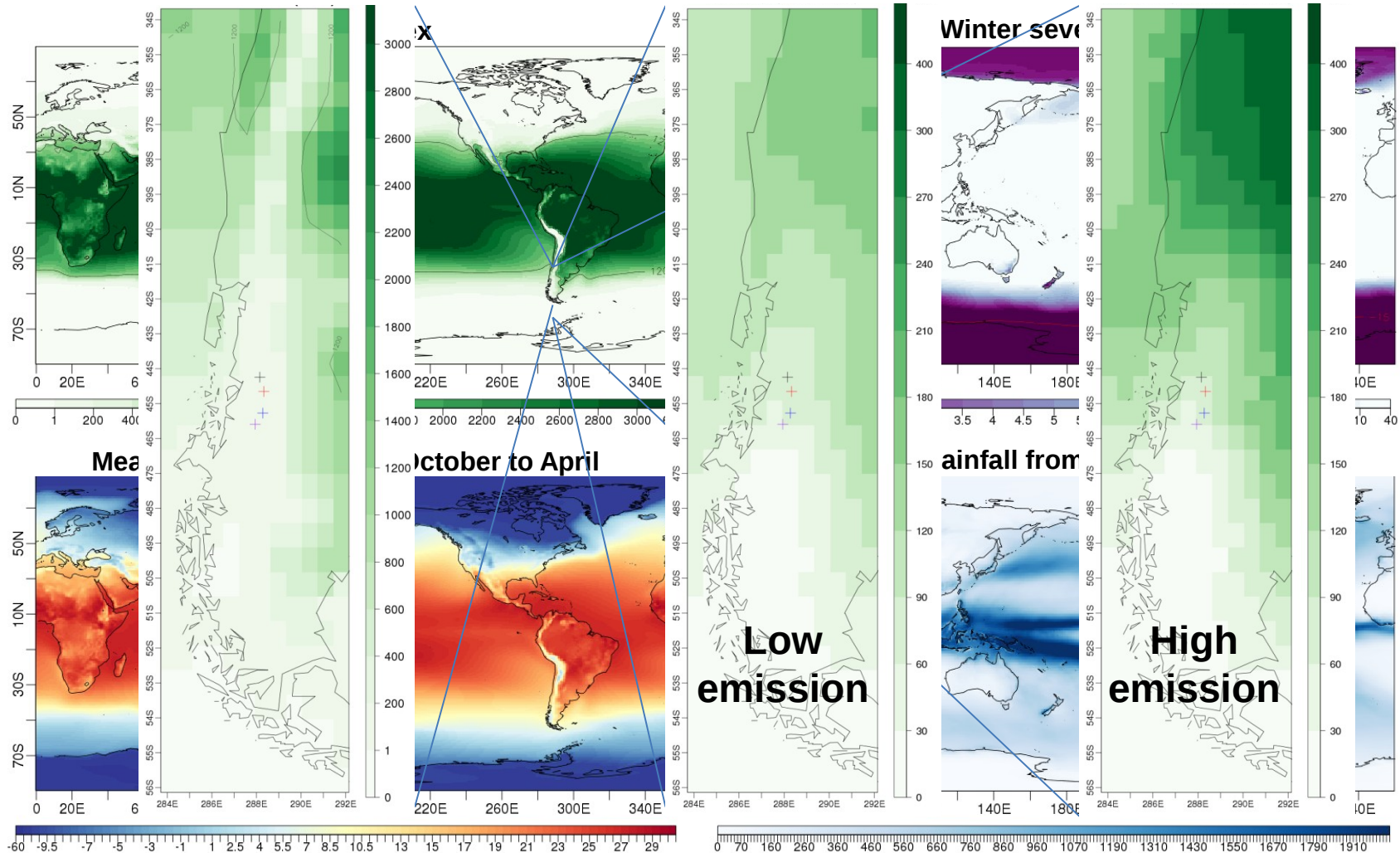
A case-study: climate projections for wine-makers

Climate change for two emission scenarios:
Present climate **Future Climate (2031-2050) – Present climate**



A case-study: climate projections for wine-makers

Climate change for two emission scenarios:
Present climate **Future Climate (2031-2050) – Present climate**



A case-study: climate projections for wine-makers

Projected climate change (2031-2050) for each wine index

<u>Wine index</u>	<u>Site 1</u>	<u>Site 2</u>	<u>Site 3</u>	<u>Site 4</u>
Mean yearly temperature	1.03°C	1.03°C	1.05°C	1.03°C
Mean temperature oct-apr	1.16°C	1.14°C	1.14°C	1.10°C
Winkler index	75.6°C	77.3°C	59.3°C	44.5°C
Winter severity index	0.85°C	0.86°C	0.96°C	0.97°C
Total yearly rainfall	-114 mm	-109 mm	-85 mm	-96 mm
Total rainfall oct-abr	-95 mm	-93 mm	-71 mm	-79 mm



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Thank you!

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